nsma

national spectrum managers association

Report WG 16.89.003

STANDARD FORMAT FOR ELECTRONIC TRANSFER

of

TERRESTRIAL ANTENNA PATTERN DATA

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RECOMMENDATION

Subject Area: Antenna Pattern Data

Title: Standard Format for Electronic Transfer of Terrestrial Antenna Pattern Data

Purpose

To establish a standard format for the electronic transfer of antenna pattern data. This transfer can be by means of magnetic media (floppy disks, tapes, etc.) or communicative media (telephone lines).

The purpose of the electronic transfer is to supplement the established data publication on paper, not to replace the paper publication. In the event of a conflict between the electronic and the published data, the published data shall take precedence.

General

At the meeting of Study Group 16-Antenna Patterns of NSMA, it was decided to establish a standard format for the electronic transfer of antenna patterns between the manufacturers, consultants, coordinators and users. This transfer would expedite the transfer of information as well as increase the accuracy.

This proposal will outline the standard format to be used for the data.

Details

1. There shall be one antenna pattern per file.
2. Each file will contain the following information in the order listed.

DATA	FORMAT
Antenna manufacturer	30data
Model number	30data
Comment	30data
FCC ID number	16data
Reverse pattern m number	16data
Date of data	16data
Manufacturer ID number	16data
Frequency range	16data
Mid-band gain	16data
Half-power beam width	16data
Polarization (data count)	7data space 7data space
Angle (dB)	7data space 7data space
Other three polarization's	

The following are detailed explanations of each of the data lines.

Antenna Manufacturer

(30data)

This is the name under which the data was filed with the FCC. There will be no abbreviations.

Full model number

(30data)

This is the full model number as used when the data was filed with the FCC. Modifiers to the model number such as dashes or exceptions are to be included.

Comment

(30data)

This is used to include comments or special conditions pertaining to the antenna described.

FCC ID number

(16data)

This is the m number issued by the Common Carrier Branch of the FCC. For services which do not issue ID numbers, insert the word (none) in either upper or lower case. In the case where the pattern has been filed with the Common Carrier Branch but the ID number is not yet issued, insert the word (preliminary).

Reverse pattern ID number

(16data)

This lists the reverse pattern FCC ID number. The reverse pattern is generally obtained by inserting the feed in a opposite manner in order to reverse the pattern.

Date of data

(16data)

This date is the date referenced on the published pattern

Manufacturer ID number

(16data)

This is the reference number assigned by the antenna manufacturer and is for reference only. If the manufacturer does not issue an ID number, then insert the word "none" in lieu of an ID number.

Frequency range

(16data)

This is to identify the full frequency range for which this pattern is valid and agrees with the range as specified in the printed pattern. *The* frequency is in Megahertz.

Mid-Band gain

(16data)

This is the gain of the antenna at mid-band. The gain is in gain above an isotropic radiator (Dali).

Half Power beam width

(16data)

This is the included angle centered on the main beam of the antenna and defies the angle where the antenna response falls -3 dB.

Polarization   Data count

(7data space)   (7data space)

The data is preceded by an indication of the polarization the data. The commonly accepted polarization designators for linear polarization are to be used:

    HH   Horizontal polarized port response to a horizontally
          polarized signal in the horizontal direction.

    HV   Horizontal polarized port response to a vertically
          polarized signal in the horizontal direction.

    VV   Vertical polarized port response to a vertically
          polarized signal in the horizontal direction

    VH   Vertical polarized port response to a horizontally
          polarized signal in the horizontal direction

   ELHH Horizontal polarized port response to a horizontally
          polarized signal in the vertical direction

   ELHV Horizontal polarized port response to a vertically
          polarized signal in the vertical direction

   ELVV Vertical polarized port response to a vertically
          polarized signal in the vertical direction

ELVH Vertical polarized port response to a horizontally
polarized signal in the vertical direction

The data count will be the number of data points to follow.

All eight responses should be included. If different
polarization's have identical responses, they are to be
duplicated in order that a full set of data be listed.

Angle   Response

(7data space)   (7data space)

A full compliment of data will show the antenna response in the
horizontal direction for a 'horizontal cut'. and in the
vertical direction for a 'vertical cut'.

The data is presented in two columns. The angle of observation
is listed first followed by the antenna response.

For the horizontal direction, the angle of observation starts
from -180 degrees (defined as the left side of the antenna) and
decrease in angle to the main beam , 0 degrees, and then
increase to +180 degrees. The full data will cover the 360
degrees of the antenna.

For the vertical direction, the angle of observation starts
from -5 degrees (defined as the antenna response below the main
beam) and decrease in angle to the main beam, 0 degrees, and
then increase to +5 degrees. The full data will cover the 10
degrees centered about the main beam.

The antenna response is listed as dB down from the main lobe
response and is shown as negative.

As a minimum, the data points are the breakpoints. That is,
those points which define a change in the slope of the data or
an adequate number of points to define a non-linear line. It is
acceptable to include periodical points (e.g. every 1 degree or
more) between the breakpoints.

3. Mechanical Standards

   A. The transfer media shall be 5.25 inch double sided
   double density floppy disks.

   B. The recording standard shall be the IBM/clone Personal
   Computer standard with the following characteristics:

      362 K capacity
      double sided
      double density
      40 tracks
      9 sectors per track
      512 bytes per sector

C. The data is recorded in ASCII format.

```
MARK ANTENNA PRODUCTS Inc.
MHP-100A120D
 (none)
M15028
M15027
11-25-85
NONE
10700-11700 MHZ
48.4 dB
0.6 Deg
HH        39
-180     -88
-160     -88
-150     -90
-97      -90
-66      -70
-48      -70
-44      -66
-24      -66
-20      -62
-16      -60
-15      -55
-12      -55
-11.5    -50
-8.5     -50
-8       -47
-6       -47
-4       -36
-1.7     -30
-1       -28
0          0
1        -28
1.7      -30
4        -36
6        -47
8        -47
8.5      -50
11.5     -50
12       -55
15       -55
16       -60
20       -62
24       -66
44       -66
48       -70
66       -70
97       -90
150      -90
160      -88
180      -88
```

```
HV      33
-180    -89
-170    -89
-160    -90
-81     -90
-75     -84
-44     -77
-26     -77
-14     -75
-12     -75
-10     -70
-5.5    -69
-4.5    -63.4
-4      -63.2
-3.5    -54.2
-2      -53
-1.25   -36
0       -36
1.25    -36
2       -53
3.5     -54.2
4       -63.2
4.5     -63.4
5.5     -69
10      -70
12      -75
14      -75
26      -77
44      -77
75      -84
81      -90
160     -90
170     -89
180     -89
VV      39
-180    -88
-160    -88
-150    -90
-97     -90
-66     -70
-48     -70
-44     -66
-24     -66
-20     -62
-16     -60
-15     -55
-12     -55
-11.5   -50
-8.5    -50
-8      -47
-6      -47
-4      -36
-1.7    -30
-1      -28
0       0
```

1	-28
1.7	-30
4	-36
6	-47
8	-47
8.5	-50
11.5	-50
12	-55
15	-55
16	-60
20	-62
24	-66
44	-66
48	-70
66	-70
97	-90
150	-90
160	-88
180	-88
VH	33
-180	-89
-170	-89
-160	-90
-81	-90
-75	-84
-44	-77
-26	-77
-14	-75
-12	-75
-10	-70
-5.5	-69
-4.5	-63.4
-4	-63.2
-3.5	-54.2
-2	-53
-1.25	-36
0	-36
1.25	-36
2	-53
3.5	-54.2
4	-63.2
4.5	-63.4
5.5	-69
10	-70
12	-75
14	-75
26	-77
44	-77
75	-84
81	-90
160	-90
170	-89
180	-89
ELHH	7
-4	-36

```
-1.7    -30
-1      -28
0       0
1       -28
1.7     -30
4       -36
ELHV    11
-4.5    -63.4
-4      -63.2
-3.5    -54.2
-2      -53
-1.25   -36
0       -36
1.25    -36
2       -53
3.5     -54.2
4       -63.2
4.5     -63.4
ELVV    7
-4      -36
-1.7    -30
-1      -28
0       0
1       -28
1.7     -30
4       -36
ELVH    11
-4.5    -63.4
-4      -63.2
-3.5    -54.2
-2      -53
-1.25   -36
0       -36
1.25    -36
2       -53
3.5     -54.2
4       -63.2
4.5     -63.4
```

Report: REP.WG16.89.003
Approved:
To Membership: 03-27-89
Notes: